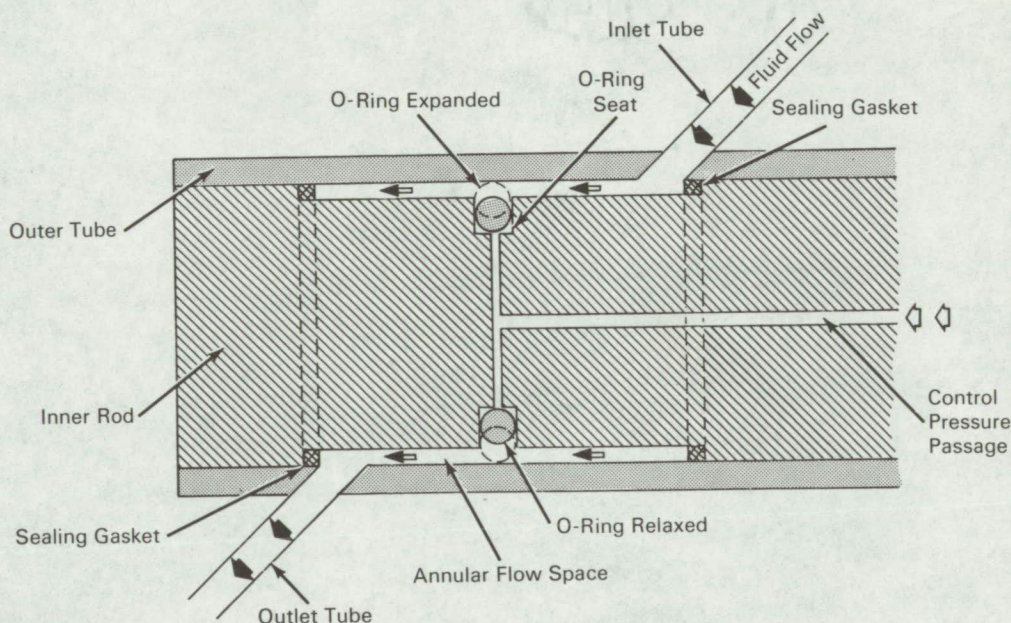


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Miniature Valve Accurately Controls Small Volume Fluid Flow



The problem:

To design a small valve which will accurately control small volume flow of liquids or gases. Conventional valve designs are not adaptable because of the small valve size and extreme accuracy desired.

The solution:

A hydraulic or pneumatic actuated valve which controls fluid flow by expanding or relaxing an O-ring within an annular flow space.

How it's done:

The valve consists of a cylindrical inner rod which is mounted within an outer cylindrical tube. Near one end of the rod is a shallow, rectangular groove around its circumference which forms the annular flow space

of the valve. At the center of this groove, an O-ring is seated within a rectangular groove of its own. Beneath the O-ring are a number of radial holes which lead to a central passage in the rod. The central passage leads out one end of the rod to a hydraulic or pneumatic pressure source. Thus, there is a direct passage from the control pressure source to the groove in which the O-ring is seated.

In the relaxed state, fluid flows down the inlet tube, through the annular space and out the outlet tube. However, if pneumatic or hydraulic pressure is applied to the control pressure passage, the O-ring will expand against the wall of the outer tube. In this expanded position, the O-ring stops all flow across the annular space.

(continued overleaf)

Notes:

1. In one application, 2 such valves were used to accurately meter small volumes of helium under a pressure of 1000 psi.
2. Inquiries concerning this innovation may be directed to:

Office of Industrial Cooperation
Argonne National Laboratory
9700 S. Cass Avenue
Argonne, Illinois 60439
Reference: B66-10473

Patent status:

Inquiries about obtaining rights for commercial use of this innovation may be made:

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(ARG-66)